Chapter 13

METRO ETHERNET CIRCUIT EMULATION SERVICES

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13.1. METRO ETHERNET CIRCUIT EMULATION SERVICES

13.1.1 Circuit Emulation Service Definition

Ethernet CES provides emulation of TDM services, such as N x 64 kbit/s, T1, E1, T3, E3, OC-3, and OC-12, across a Metropolitan Ethernet Network (MEN). The objective is to allow MEN service providers to offer TDM services to customers. Hence it allows MEN service providers to extend their reach and addressable customer base. For example, the use of CES enables metro Ethernet transport networks to connect to PBXs on customer premises and to deliver TDM voice traffic alongside data traffic on metro Ethernet.

The CES is based on a point-to-point connection between two Inter-Working Functions (IWF). Essentially, CES uses the MEN as an intermediate network (or virtual wire) between two TDM networks. This setup is handled as an application of the Ethernet service, using the interworking function to interface the applications layer onto the Ethernet services layer.
13.1.1.1 TDM Line Service (T-Line)

The TDM Line (T-Line) service provides TDM interfaces to customers (N x 64 kbit/s, T1, E1, T3, E3, OC-3, OC-12, etc.), but transfers the data across the MEN instead of a traditional circuit switched TDM network. From the customer perspective, this TDM service is the same as any other TDM service, and the service definition is given by the relevant ITU-T and ANSI standards pertaining to that service.

From the provider’s perspective, two CES interworking functions are provided to interface the TDM service to the Ethernet network. The CES interworking functions are connected via the Metro Ethernet Network (MEN) using point-to-point Ethernet Virtual Connections (EVCs), as illustrated in Figure 13-1.

The TDM Service Processor (TSP) block shown in Figure 13-1 consists of any TDM grooming function that may be required to convert the TDM service offered to the customer into a form that the CES IWF can accept. For example, the TSP may be a Framer device, converting a fractional DS1 service offered to the customer into an N x 64 kbit/s service for transport over the MEN. The operation of the TSP is outside the scope of this chapter.

The TSP and the CES IWF may physically reside in the Provider Edge (PE) unit at the provider’s nearest point-of-presence, or in a service provider-owned box in a customer location (e.g., a multitenant unit). From the architecture perspective, there is no difference between these alternatives.

Figure 13-1: TDM line service over Metro Ethernet Networks